Executive Summary

Introduction

The Voluntary Reporting of Greenhouse Gases Program, required by Section 1605(b) of the Energy Policy Act of 1992, records the results of voluntary measures to reduce, avoid, or sequester greenhouse gas emissions. For the 2003 reporting year, 234 U.S. companies and other organizations reported to the Energy Information Administration (EIA) that they had undertaken 2,188 projects to reduce or sequester greenhouse gases in 2003. The reported greenhouse gas emission reductions for the projects reported included 268 million metric tons carbon dioxide equivalent of direct reductions, 81 million metric tons of indirect reductions, 7 million metric tons of reductions from carbon sequestration, and 16 million metric tons of unspecified reductions (Table ES1). Total U.S. greenhouse gas emissions in 2003 are estimated at 6,936 million metric tons carbon dioxide equivalent.[1]

For definitional purposes, direct reductions are emission reductions from sources owned or leased by the reporting entity; indirect reductions are emission reductions from sources not owned or leased by the reporting entity but that occur as a result of the entity's activities; carbon sequestration reductions represent the removal of atmospheric carbon to a carbon sink; and unspecified reductions represent emission reductions reported on Form

Table ES1. Reporting Indicators for the Voluntary Reporting of Greenhouse Gases Program, Data Years 1994-2003

Indicator	1994	1995	1996	1997	1998	1999	2000	2001	2002(R)	2003
Number of Entities Reporting	108	142	150	162	207	207	236	232	234	234
Number of Projects Reported	634	960	1,040	1,288	1,549	1,722	2,089	1,897	2,055	2,188
Number of Entity-Level Reports Received	40	51	56	60	76	83	108	114	119	126
Project-Level Reductions Reported (Million Metric Tons Carbon Dioxide Equivalent)										
Direct[a]	63	88	90	95	148	155	211	247	265	268
Modified Reference Case[b]	59	76	75	88	127	126	176	209	257	261
Basic Reference Case[c]	4	13	15	7	21	29	35	38	8	7
Indirect[d]	5	52	53	38	43	57	62	72	80	81
Modified Reference Case[b]	5	52	51	36	38	51	57	61	78	75
Basic Reference Case[c]	0	1	3	2	5	6	5	11	2	6
Sequestration[e]	1	1	9	10	12	10	9	8	7	8
Unspecified[f]	4	6	6	9	19	13	12	15	17	16

[a]"Direct" emission reductions are reductions in releases of greenhouse gases "on site." For the purpose of completing Form EIA-1605, "on site" is defined as any source owned (wholly or in part) or leased by the reporting entity.

[b]In a "modified reference case," actual emissions (or sequestration) are compared to an estimate of what emissions (or sequestration) would have been in the absence of the project.

[c]In a "basic reference case," actual emissions (or sequestration) are compared with an estimate of historical emissions (or sequestration) in a particular base year or an average of up to 4 years.

[d]"Indirect" emission reductions are reductions in emissions from sources not owned or leased by the reporting entity but that occur, wholly or in part, as a result of the entity's activities (for example, an automobile manufacturer's investment in increased automotive fuel economy can result in decreased emissions from vehicles owned by individuals or managed fleets).

[e]"Sequestration" is the fixation of atmospheric carbon dioxide in a carbon sink through biological or physical processes, such as photosynthesis.

[f]"Unspecified" emission reductions represent quantities reported on the short form (Form EIA-1605EZ) for which the reporting entity did not specify whether the emission reduction or carbon sequestration was direct or indirect.

(R) = revised.

Notes: 2002 data have been revised to include reports that were submitted after the filing deadline. It is expected that the 2003 data will also be revised upward in next year's report with the inclusion of late 2003 reports. Totals for direct and indirect reductions may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

[1]Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2003*, DOE/EIA-0573(2003) (Washington, DC, December 2004), web site www.eia.doe.gov/oiaf/1605/ggrpt.

EIA-1605EZ, on which the reporting entity cannot specify whether the emission reduction was a direct or indirect reduction.

To calculate reported emission reductions, reporters are allowed to use a "basic" reference case or a "modified" reference case. A reference case is an emissions or sequestration level against which actual emissions are compared in order to estimate emission reductions. In a "basic" reference case, actual historical emissions (or sequestration) in a specific year, or an average of a range of years, are used. In a "modified" reference case, an estimate is made of what emissions or sequestration would have been in the absence of the project.

Generally, as illustrated in Table ES1, most reductions are reported relative to a modified reference case. For 2003, 261 million metric tons, or 97 percent, of the total 268 million metric tons carbon dioxide equivalent of reported direct reductions was based on modified reference cases. Similarly, for reported indirect reductions, 75 million metric tons, or 92 percent, of the total 81 million metric tons carbon dioxide equivalent of reported indirect reductions was based on modified reference cases.

The number of entities (234) reporting to the Voluntary Reporting Program for 2003 is the same as the number that reported for 2002; however, the number of reporters for 2002 has been revised upward to include 6 additional entities that filed late reports, after the 2002 database was closed. EIA also expects a similar upward revision of the number of 2003 reporters in next year's report, to reflect late reporters in the 2003 reporting cycle. As of February 7, 2005, EIA had received 6 additional 2003 reports and 1 additional 2002 report since the 2003 database was closed for preparation of this 2003 annual report.[2]

The number of entities reporting to the program has grown by 117 percent from its inception in 1994, when 108 entities reported. The number of projects reported has grown at a more rapid rate than the number of reporters, because the number of projects reported by repeat reporters has increased. The 2,188 projects reported for 2003 represent an increase of 245 percent over the 634 projects reported in 1994 and a 7-percent increase from the final tally of 2,055 projects reported for 2002.

Of the 234 organizations reporting for 2003, 126 provided entity-level reports, which include estimates of emissions and/or emission reductions for their entire organizations—7 more than the number (119) that submitted entity-level reports in 2002. In addition, 89 of the reporters for 2003 recorded commitments to take action to reduce emissions, mostly during the 2000 to 2005 time frame.

Of the 126 organizations reporting at the entity level, 120 calculated their 2003 entity-level greenhouse gas emissions. These entities reported direct greenhouse gas emissions of 889 million metric tons carbon dioxide equivalent, equal to about 14 percent of total U.S. greenhouse gas emissions in 2003.[3] Also reported by these organizations was 105 million metric tons carbon dioxide equivalent of indirect emissions, equal to 2 percent of total U.S. greenhouse gas emissions in 2003. Of the 126 entity-level reporters, 117 also reported emission reductions, including 214 million metric tons carbon dioxide equivalent of direct emission reductions, 42 million metric tons carbon dioxide equivalent of indirect emission reductions, and 7 million metric tons carbon dioxide equivalent of emission reductions resulting from carbon sequestration projects.

Reports for 2003 were received from participants in 27 different industries or services, as compared with the 29 different industries or services for 2002. The number of different industries represented continues to be higher than it was in the first year of the program (1994 data year), when the 108 reports received included participants in 9 different industries or services (Table ES2). In the early years of the program, reporting was dominated by the electric power sector. In the first reporting year, the 95 submissions from electric power producers represented 88 percent of the 108 reports received (Figure ES1). Since then, the program has seen an influx of new participants from outside the electric power sector, representing a diverse set of other industries. In addition, several mergers and acquisitions involving reporters to the Program have accompanied the ongoing restructuring of the electric power industry. Many of these merged entities have submitted single, consolidated reports, thus reducing the number of reports received from electricity producers. As a result, only 42 percent of the organizations reporting to the Program for 2003 (98 firms) were from the electric power sector.

Although the number of reporters from other individual industries remains relatively small, in many cases, reports were received from key companies in those other industries: for example, DaimlerChrysler Corporation, General Motors, the Ford Motor Company, and

[2]The deadline for submitting reports to EIA for inclusion in each annual edition of the Public Use Database is June 1. EIA typically grants reporters extensions to the deadline, usually until early July, before closing the database to new reports to allow analysis of the information for the annual report. EIA includes reports received after the database has been closed in the next annual edition of the Public Use Database and revises the data for that reporting year in the corresponding annual report, to reflect the addition of late reports.

[3]Based on total emissions from Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2003*, DOE/EIA-0573(2003) (Washington, DC, December 2004), web site www.eia.doe.gov/oiaf/1605/ggrpt.

Table ES2. Forms Filed by Standard Industrial Classification, Data Years 1994-2003 (Number of Reports)

SIC Code	Description	Data Year									
		1994	1995	1996	1997	1998	1999(R)	2000(R)	2001(R)	2002(R)	2003
01	Agricultural Production: Crops	—	—	—	—	1	—	—	1	—	—
08	Forestry	1	2	1	1	3	3	1	—	1	2
12	Coal Mining	1	2	2	1	4	3	4	6	7	4
13	Oil and Gas Extraction	—	—	—	—	—	1	1	1	1	1
14	Nonmetallic Minerals, Except Fuels	—	—	—	—	1	1	—	—	—	—
20	Food and Kindred Products	—	—	—	—	1	2	6	4	4	4
22	Textile Mill Products	—	—	—	—	—	1	5	11	12	14
23	Apparel and Other Textile Products	—	—	—	—	—	—	1	1	2	2
24	Lumber and Wood Products	—	—	—	—	—	—	1	—	—	—
25	Furniture and Fixtures	—	—	—	—	—	—	1	1	1	—
26	Paper and Allied Products	—	—	—	—	—	1	1	—	—	—
27	Printing and Publishing	—	1	—	1	—	1	1	—	—	—
28	Chemical and Allied Products	1	3	2	3	8	5	11	9	11	11
29	Petroleum Refining and Other Related Industries	—	—	2	3	8	8	7	6	6	5
30	Rubber and Miscellaneous Plastic Products	—	—	—	—	—	—	2	2	2	2
32	Stone, Clay, Glass, and Concrete Products	—	—	1	4	12	13	7	5	5	5
33	Primary Metals Industries	2	2	4	4	5	5	5	11	11	11
34	Fabricated Metal Products, Except Machinery and Transportation Equipment	—	2	1	1	3	1	1	1	1	1
35	Industrial and Commercial Equipment and Components	—	—	—	—	—	—	1	1	1	2
36	Electronic and Other Electrical Equipment	1	1	2	4	4	4	9	9	8	6
37	Transportation Equipment	1	1	1	2	3	5	6	7	9	10
38	Instruments and Related Products	—	—	—	—	2	—	1	1	1	1
39	Miscellaneous Manufacturing Industries	—	1	1	—	2	2	1	1	1	1
40	Railroad Transportation	—	—	—	—	—	—	—	—	—	1
48	Communications	—	—	—	—	—	1	—	—	1	1
49	Electric, Gas, and Sanitary Services	95	121	125	129	138	135	151	145	138	141
57	Furniture and Home Furnishings Stores	—	—	—	—	2	1	1	—	1	1
63	Insurance Carriers	—	—	—	—	—	—	—	—	—	1
65	Real Estate	—	1	1	1	1	1	1	1	1	—
67	Holding and Other Investment Offices	—	—	1	1	1	1	1	1	2	2
72	Personal Services	—	—	—	—	—	—	1	1	1	1
80	Health Services	—	—	—	—	1	—	—	—	—	—
82	Educational Services	1	2	2	2	—	2	—	—	—	—
86	Membership Organizations	—	—	—	1	1	1	1	—	1	—
87	Engineering and Management Services	—	—	2	2	2	1	—	1	—	—
88	Private Households	2	1	1	1	1	1	1	1	1	1
89	Services Not Elsewhere Classified	—	—	—	1	1	3	2	1	1	1
91	Executive, Legislative, and General	—	—	—	—	1	2	2	2	1	1
97	National Security and International Affairs	—	—	—	—	—	—	1	—	—	—
99	Nonclassifiable Establishments	—	—	—	—	—	—	—	—	1	—
Total Number of Reporters[a]		**108**	**142**	**150**	**162**	**207**	**207**	**236**	**232**	**234[b]**	**234**
Number of 2-Digit SIC Codes Represented		**9**	**13**	**16**	**18**	**24**	**27**	**31**	**27**	**29[b]**	**27**

[a]Totals may be greater than the sum of reporters in each SIC code, because confidential reporters are excluded from the latter.

[b]Includes 6 late reports for the 2002 data year. The 2003 total will also be revised upward in next year's report with the inclusion of late 2003 reports. As of February 22, 2005, EIA had received 6 late 2003 reports, which are not included in this report's 2003 database.

(R) = Revised.

Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

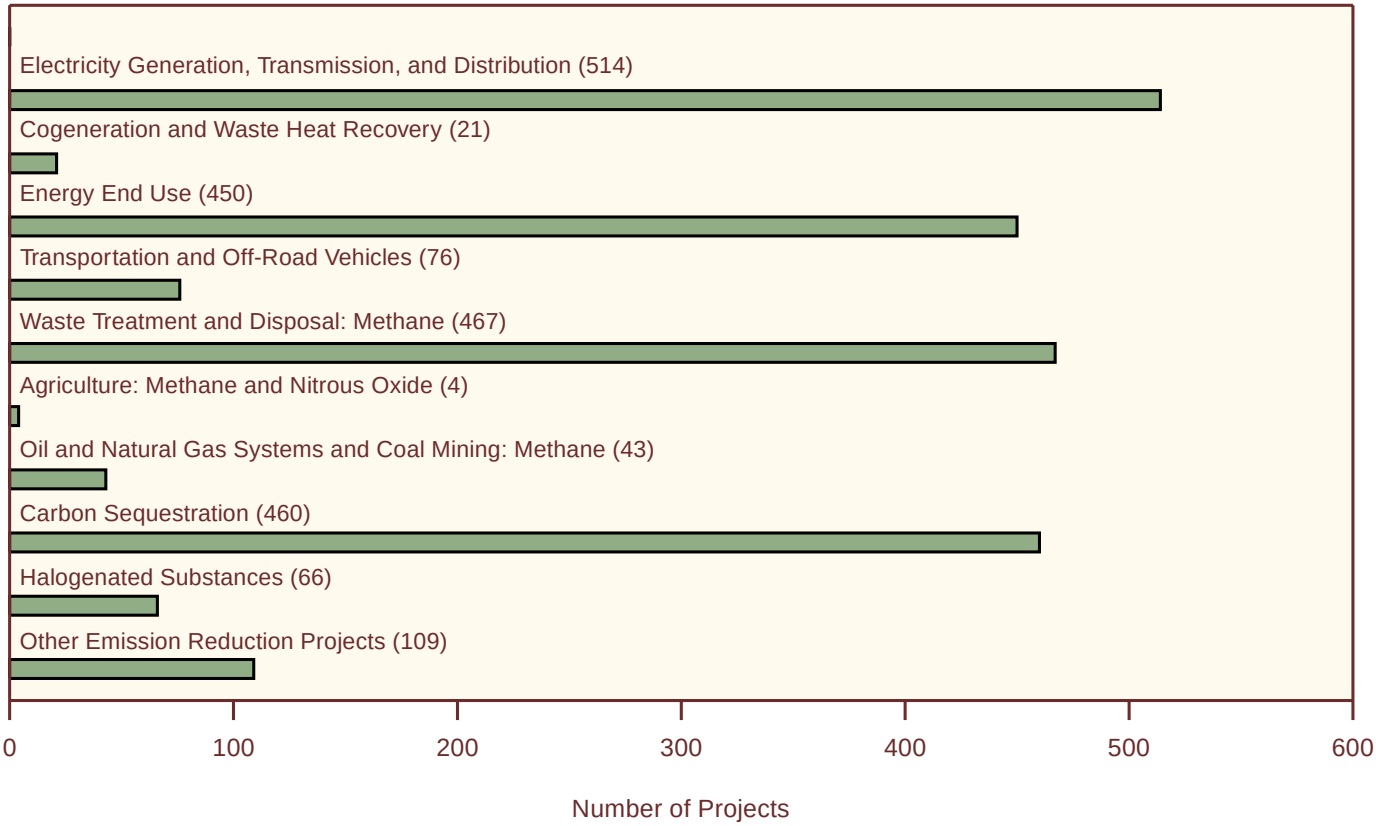
Toyota North America in the automotive products industry; Noranda and an operating division of Alcan's Primary Products in the metals industry; Sunoco, Inc., ChevronTexaco Corporation, and BP America in the petroleum industry; Johnson & Johnson and The Dow Chemical Company in the chemicals industry; Rolls Royce in the aerospace industry; Bristol-Myers Squibb Company and Pfizer Pharmaceuticals, LLC, in the pharmaceuticals industry; and Advanced Micro Devices, Inc., and IBM in the electronic equipment industry.[4]

Projects Reported

Electric power sector reporters (including independent power producers) accounted for 1,485 (68 percent) of the projects reported for 2003. Also reporting were alternative energy providers (446 projects), industrial concerns (245 projects), and agriculture and forestry organizations (3 projects). Organizations in other sectors (government, commercial, and residential) submitted reports on 9 projects.

Most of the projects reported for 2003 affected energy supply or use. The electric power sector reported 514 projects that were related to the generation, transmission, or distribution of electricity (Figure ES1). Another 450 were related to energy end use, 76 were transportation projects, and 21 were cogeneration projects. Other projects reduced emissions of methane from waste treatment and disposal facilities (467 projects), from oil and natural gas systems and coal mines (43 projects, many of which included the displacement of fossil fuels through the use of methane as a fuel), and from agricultural activities (4 projects). Other projects (109) included the reuse of fly ash in concrete and materials recycling, which reduce emissions in part by reducing energy consumption. The largest reductions were reported for projects that improved the performance of nuclear power plants. The non-energy-related projects reported fell into two major categories: sequestration of carbon, usually in forests (460 projects); and recycling, reuse, or destruction of halogenated substances, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) (44 projects).

Figure ES1. Number of Projects Reported to the Voluntary Reporting of Greenhouse Gases Program by Project Type, Data Year 2003



Source: Energy Information Administration, Forms EIA-1605 and EIA-1605EZ.

[4]A complete listing of all 2003 reporters is provided in Appendix B, Table B1, pages 89-92. Table B8 in Appendix B, pages 114-118, lists reporters by sector and Standard Industrial Classification (SIC) code.

Reductions Reported

Electric Power

For 2003, 485 electric power and cogeneration projects were reported on Form EIA-1605.[5] Total emission reductions from electric power and cogeneration projects reported on Form EIA-1605 (the long form) included 158 million metric tons carbon dioxide equivalent from direct sources and 18 million metric tons from indirect sources. A total of 257 projects that reduced the carbon content of fuels used to generate electricity were reported, with emission reductions totaling 147 million metric tons carbon dioxide equivalent from direct sources and 13 million metric tons from indirect sources. Reported emission reductions for projects increasing energy efficiency in generation, transmission, and distribution included 16 million metric tons carbon dioxide equivalent from direct sources and 4 million metric tons from indirect sources. Another 50 electric power and cogeneration projects were reported on Form EIA-1605EZ for 2003, with reported emission reductions from unspecified sources that totaled 11 million metric tons carbon dioxide equivalent.[6]

Energy End Use and Transportation

For 2003, 375 energy end use and transportation projects were reported on Form EIA-1605, with total reported emission reductions of 25 million metric tons carbon dioxide equivalent from direct sources and 10 million metric tons from indirect sources. Nearly all (93 percent) of the energy end-use reductions were reported for stationary-source applications, such as building shell improvements, lighting and lighting control, appliance improvement or replacement, and heating, ventilation and air conditioning (HVAC) improvements. Much smaller reductions were reported for the 66 transportation projects reported on the long form, including 2.5 million metric tons carbon dioxide equivalent from direct sources and 0.1 million metric tons from indirect sources. Another 86 energy end-use and transportation projects were reported for 2003 on Form EIA-1605EZ, with total emission reductions of 0.4 million metric tons carbon dioxide equivalent.

Carbon Sequestration

There were 446 carbon sequestration[7] projects submitted on Form EIA-1605 for 2003, with total reported sequestration of 8 million metric tons carbon dioxide equivalent. Most of the reported reductions resulted from afforestation, reforestation, urban forestry, forest management, and forest preservation efforts. Another 14 carbon sequestration projects were reported on Form EIA-1605EZ, for which about 29,000 metric tons carbon dioxide equivalent of sequestered carbon was reported.

Methane and Nitrous Oxide Emissions

Emission reductions for the 470 methane and nitrous oxide abatement projects reported for 2003 on Form EIA-1605 included 69 million tons carbon dioxide equivalent from direct sources and 40 million metric tons from indirect sources. The three most frequently reported sources of methane reductions were municipal waste landfills (412 projects), natural gas systems (28 projects), and coal mines (13 projects). In addition to reducing methane emissions, projects that involved the recovery and use of methane for energy also reduced carbon dioxide emissions by displacing fossil fuels, such as oil and coal, that have higher carbon contents and thus produce more carbon dioxide when burned. Another 44 methane or nitrous oxide reduction projects were reported on Form EIA-1605EZ for 2003, with reported reductions of methane or nitrous oxide emissions that totaled 4 million metric tons carbon dioxide equivalent.

Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride

A total of 66 projects were submitted on Form EIA-1605 for 2003 that reported reductions in emissions of HFCs, PFCs, and SF_6. Reductions reported for these projects included 6.1 million metric tons carbon dioxide equivalent from direct sources and 2.4 million metric tons from indirect sources. The largest reported reductions were direct reductions of perfluoromethane (a type of PFC) (3.0 million metric tons carbon dioxide equivalent), SF_6 (2.6 million metric tons carbon dioxide equivalent), and perfluoroethane (a type of PFC) (0.6 million metric tons carbon dioxide equivalent). Reductions of PFCs and SF_6 totaling 29 thousand metric tons carbon dioxide equivalent were reported for one project on Form EIA-1605EZ.

[5]The Voluntary Reporting of Greenhouse Gases Program allows reporting on two forms: EIA-1605 and EIA-1605EZ. EIA-1605, the long form, allows reporters to create an in-depth, multi-year, public record of emission reduction efforts for an entire organization and/or for individual projects, including information on activities conducted outside the United States and commitments to reduce greenhouse gas emissions in the future. EIA-1605EZ, the short form, allows reporters only to provide brief summaries of greenhouse gas projects for the current reporting year; it does not allow reporting of activities outside the United States or of future emission reduction commitments.

[6]The emission reductions reported on Form EIA-1605EZ are unspecified, because the form does not ask the reporter to distinguish between direct and indirect reductions.

[7]Carbon sequestration is the fixation of atmospheric carbon dioxide in a carbon sink through biological or physical processes.